

# Arizona Science Standards Revision Working Group

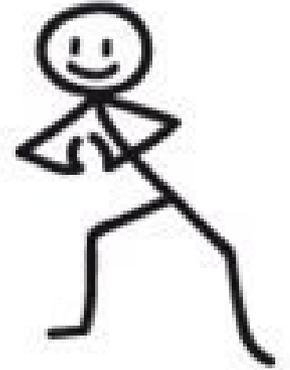
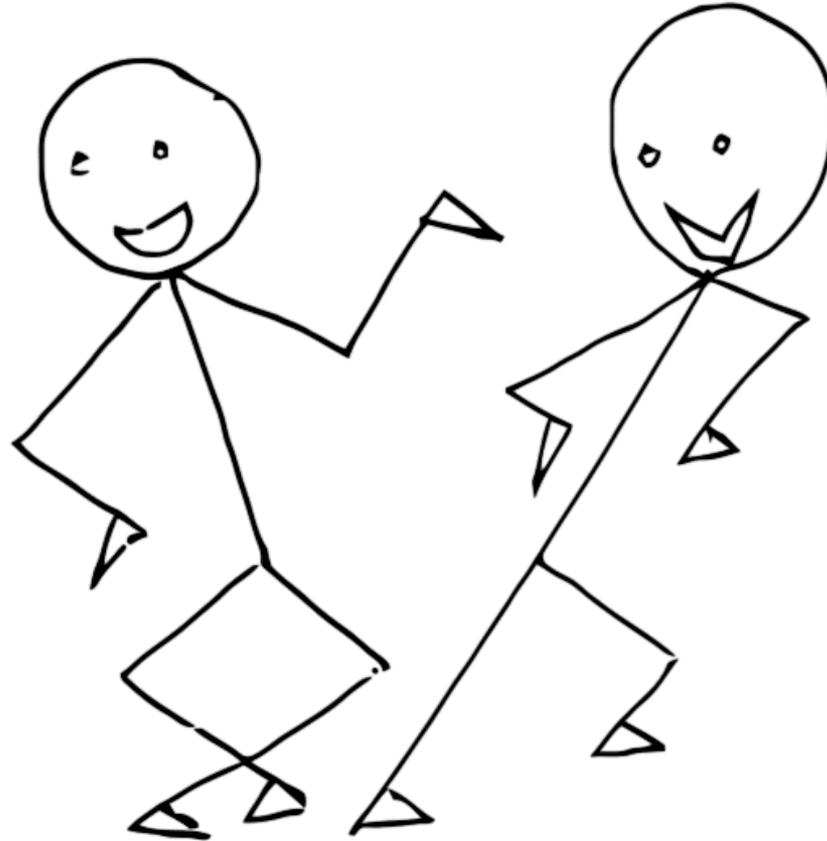


# Housekeeping

1. Sign in
2. Parking validation
3. Restrooms
4. Breaks/Lunch
6. Travel Questions – Fill out W9 if needed
7. Sign non-disclosure form – All members

***Cell phones should only be used during breaks and lunch. If you need to take a call, please go to the break room. Please check text and email only during break due to non-disclosure.***

# Biggest Thank You & Happy Dance!

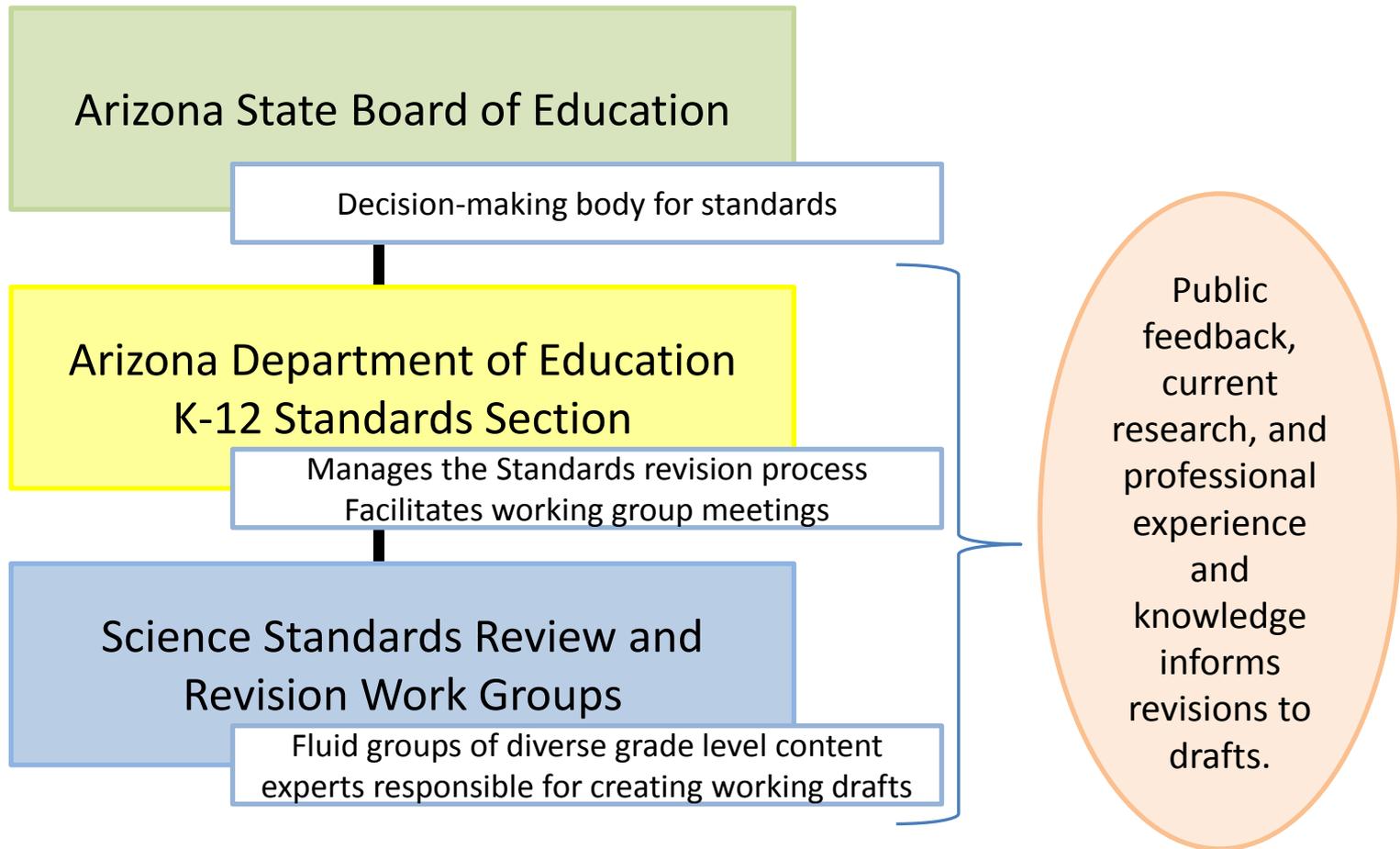


# Introductions

Introduce yourself by telling everyone in the group:

1. Your name
2. Your school/district
3. Your current position

# Standards Review - Structure



# Roles/Responsibilities: ADE K-12 Standards Staff

## ADE K-12 Standards Members

- Facilitate work group meetings
- Provide meeting goals, agendas, tasks, and instructions
- Provide needed materials
- Organize committee members into vertical, horizontal, and/or content groups, as appropriate.

# Roles/Responsibilities: Working Groups

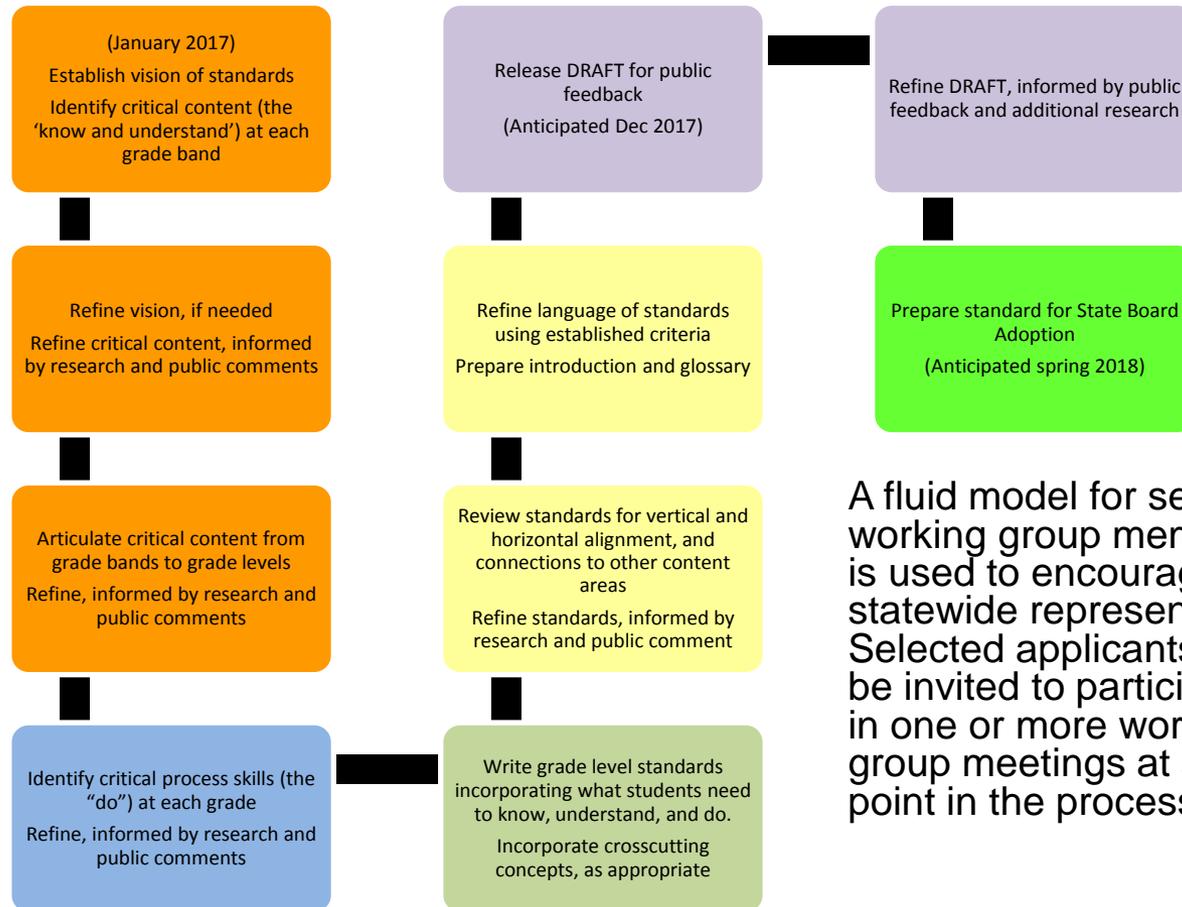
- 1. Develop the vision for the revised Science Standards**
- 2. Develop drafts of K-12 Science Standards**
  - Make decisions about content and structure of grade level standards
  - Apply content knowledge, grade-level expertise, research, and public feedback to inform all decisions
- 3. Develop drafts of the introduction, glossary, and other appendices, as needed for the K-12 Science Standards**

# Structure: Working Groups

Use a fluid membership model (“accordion model”) to include multiple voices and perspectives throughout the process

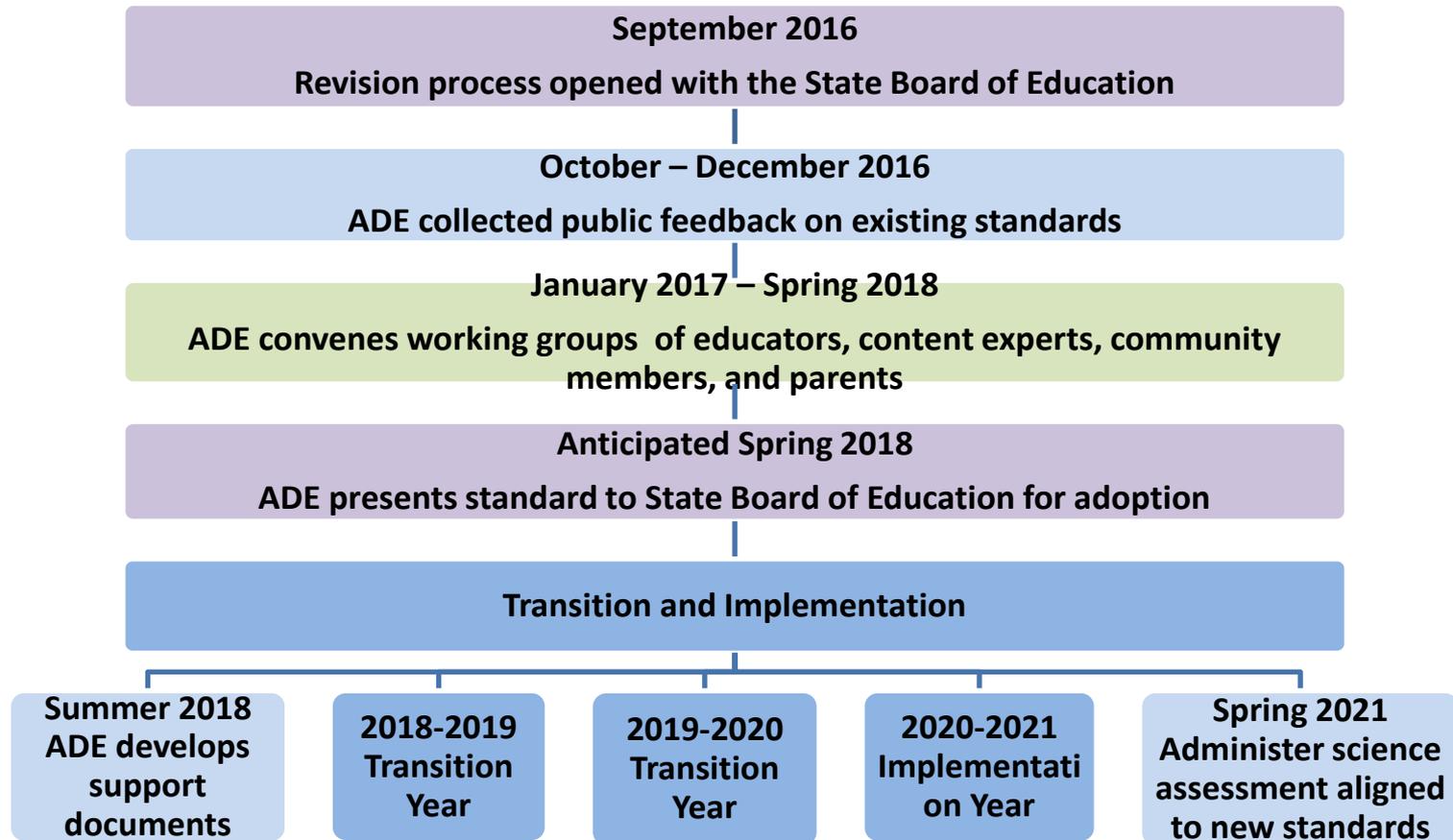
- K-12 teachers, coaches, curriculum directors, administrators
- Higher education: science education and science content instructors, professors, and/or researchers
- Content experts from the community
- Parents

# Standards Review - Structure



A fluid model for selecting working group members is used to encourage statewide representation. Selected applicants may be invited to participate in one or more working group meetings at any point in the process.

# Science Standard Revision and Implementation Timeline



# Working Group Norms

- Actively engage in all discussions
- Be open-minded
- Have an attitude that fosters collaboration, agreement, and consensus
- Be mindful of timelines and scope of work
- **Cell phone/email checks are limited to breaks (non-disclosure)**

# Questions on Structure



# ADE Directive for the Science Standards

- Arizona standards, written for Arizona teachers and students, by Arizona educators and content experts
- Write grade-level standards and not performance objectives

# Standards, Curriculum, & Instruction

**Standards** – What a student needs to know, understand, and be able to do by the end of each grade. Standards build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels. Standards are adopted at the state level by the State Board of Education.



**This is the “WHAT”**



# Standards, Curriculum, & Instruction

**Curriculum** – The resources used for teaching and learning the standards. Curricula are adopted at a local level by districts and schools.

**Instruction** – The methods used by teachers to teach their students. Instructional techniques are employed by individual teachers in response to the needs of the students in their classes to help them progress through the curriculum in order to master the standards.



**This is the “HOW”**



# Standards versus Performance Objectives

## Content Standards

Standards are what students need to know, understand, and be able to do **by** the end of each grade level. Standards build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels.

## Performance Objectives

Performance Objectives are **incremental steps** toward mastery of individual content standards. Performance Objectives are knowledge and skills that a student must demonstrate at each grade level. Performance objectives do not imply a progression of learning and, because they are discrete skills, reach a limited level of cognitive demand.

# Work to Date:

- Developed a working vision to guide all future science standards work
- Identified critical content for each grade band/big idea



# Work to Date:

## Last Meeting

- Reviewed public feedback for each progression.
- Refined critical content/progressions based on public feedback, research, and expertise.
- Discussed role of crosscutting concepts in determining how to articulate grade bands to grade levels.



# A Framework for K-12 Science Education

## Cross-cutting Concepts

- 1. Patterns**
- 2. Cause and effect**
- 3. Structure and Function**
- 4. Energy and Matter**
- 5. Systems and System Models**
- 6. Scale, Proportion and Quantity**
- 7. Stability and Change**

# Articulate by Grade Level



## Use Grade Level Charts

1. Review Working Group Agreements
2. **Copy** critical content from the first column (grade band) into the appropriate grade level column(s).
  - Base decisions on research, other states' standards, public feedback, and your expertise.
3. Identify crosscutting concepts (add to gray bar) as appropriate.

# Refine Critical Content

Standards are **what students need to know, understand**, and be able to do by the end of each grade level.

- Refine critical content on the grade level charts.
- Critical content is **what students need to know and understand** in each standard.
  - Base decisions on research, other states' standards, public feedback, and your expertise.
  - Future meetings will determine what **students need to be able to do** with the critical content.

# Refine Critical Content

Disciplinary Core Ideas from [A Framework for K-12 Science Education](#)  
(Grade Band Endpoints for ESS2.B; page 183)

Plate tectonics is the unifying theory that explains the past and current movements of the rocks at Earth's surface and provides a framework for understanding its geological history. Plate movements are responsible for most continental and ocean floor features and for the distribution of most rocks and minerals within Earth's crust. Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.

# Refine Critical Content

MA: 6.MS.ESS2-3

Analyze and interpret maps showing the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence that Earth's plate have moved great distances, collided, and spread apart.

OK: 8.MS-ESS2-3 / CA: 7.MS-ESS2-3 / MT: MS-ESS2-3

Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

# Thank you!

